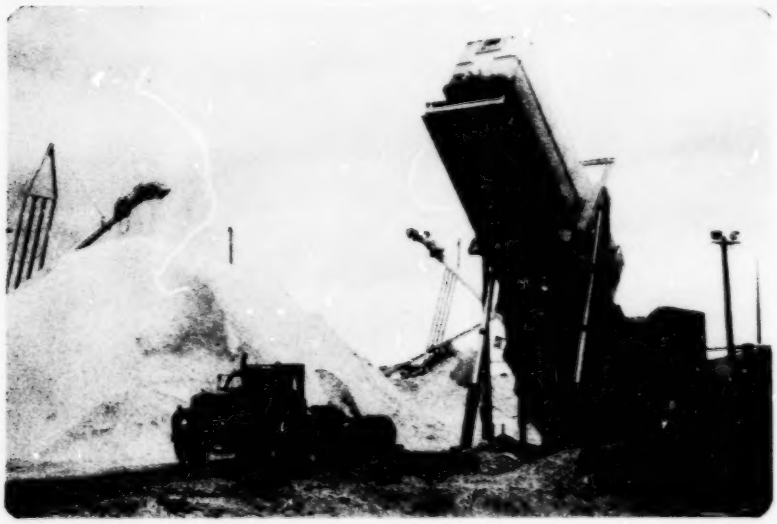
Energy Note

ENERGY FROM WOOD: A STATUS REPORT, JUNE 1984

Wood is an important energy source in Ontario. Today's energy costs have improved the economic feasibility of wood fuel for Ontario industries, businesses, institutions, farms, and homes. As well, Ontario is well-endowed with wood and wood waste.

The forestry industry and other wood processing industries produce millions of tonnes of wood residue a year. Logging operations leave stumps, branches and tree tops on the forest floor. Processing mills burn or dump over a million tonnes of wood residue a year.

Currently available wood energy systems can convert wood or wood residue to hot air, steam, electricity or "wood gas", a possible substitute for natural gas. In fact, Ontario pulp and paper mills now rely on wood residue for about 40 per cent of their energy needs.



BARK AND SAWDUST -- WOOD RESIDUE HAS BECOME AN IMPORTANT ENERGY SOURCE FOR ONTARIO

Energy Ontario

In addition to the primary wood processing industries, secondary wood industries in the Golden Horseshoe area alone produce more than 160,000 tonnes a year which represents a disposal cost for these industries. Energy recovery can represent a viable option for using this waste.

MINISTRY OF ENERGY POLICY

The Ministry of Energy supports wood energy projects as part of the Ontario government's commitment to reduce oil consumption, increase energy self-reliance, and recover resource values in waste. By 1995, the Ministry aims to boost the amount of Ontario-produced energy from its current portion of 25 per cent to 37.5 per cent.

By 1995, the Ministry expects waste and biomass to supply 4 per cent of Ontario's energy needs -- a big jump from the current 1 per cent. Although some will be supplied by municipal solid waste and agricultural resources and waste, wood and wood residue are expected to supply half the amount, or 2 per cent of Ontario's energy needs.

By 1995, wood energy is projected to supply the energy equivalent of 15 million barrels of oil -- enough to heat 750,000 homes. One million barrels of oil equivalent (BOE) can heat nearly 50,000 homes for a year.

WOOD ENERGY PROJECTS SUPPORTED BY MINISTRY OF ENERGY

The Ministry of Energy supports wood energy projects in two key areas: re-use of wood residue and cultivation of hybrid poplar tree farms. The following projects have received some assistance from the Ontario government. See Appendix I for more detailed statistical information.

BioShell, a subsidiary of Shell Canada, turns sawmill residue into compressed wood pellets called Energex fuel pellets. Plants in Iroquois Falls and Hearst can produce 200,000 tonnes of pellets a year. Much is used by Abitibi-Price to fuel industrial boilers.

Grenville Christian College, a private school in Brockville, uses a wood-burning system to provide hot water and space heating. The system, installed in 1982, burns sawdust, wood chips and bark from nearby mills. In 1982/83, it cut heating costs from $100,000 to $25,000.

Kakabeka Timber Limited, a sawmill near Thunder Bay, uses sawdust and wood chips to fuel a dry kiln formerly fired by propane. The system saves about $70,000 a year in fuel costs.

Foothill Greenhouses Ltd., in the Holland Marsh area, uses a sawdust-burning system to heat a greenhouse complex producing cucumbers. Installed in 1982, the system reduces energy costs by about $40,000 a year.

Jim Vonk's greenhouse, also in the Holland March area, demonstrates another system which uses wood waste to replace oil. It is expected to save $14,000 a year.

David Smith, a farmer in Port Ryerse, has a small scale system which burns sawdust, corn cobs, peanut shells, and other waste to fire a 60-horsepower, restored locomotive boiler. The boiler provides heat to dry grain and heat a small greenhouse growing tomatoes. Much of the system was built with used parts.

Hillcrest High School in Thunder Bay was Ontario's first public school to switch from natural gas to waste wood fuel. The system, costing $263,000, is expected to pay for itself by 1990 and save $500,000 in fuel costs during its lifetime. Scrap wood is supplied by a local lumber and planing mill.

Kingsway College, in Oshawa, installed a system in early 1984 which cost $1.3 million and is expected to reduce heating costs by $100,000 a year. The cost-free fuel comes from the college's furniture factory which produces more than 2,000 tonnes of scrap wood a year. The scrap can produce the energy equivalent of 4,800 barrels of crude oil, enough to provide hot water and heating for all 44 buildings on the 98-hectare campus.

RESIDENTIAL WOOD ENERGY PROJECTS

Estimates show that 800,000, or 25 per cent of the homes in Ontario, now rely on wood as a primary or secondary energy source. Last year, at least 9,000 homeowners converted to wood heat.

Near Dorset, Ontario, the Leslie M. Frost Natural Resources Centre demonstrates three different wood-fired central heating systems in homes originally heated by oil. Monitoring has provided valuable data on relative performance and cost-effectiveness.

In Minden, Ontario, the Ministry of Energy and Canadian Solifuels Inc. have a cost-sharing agreement to demonstrate a wood pellet delivery system. CSI will provide bulk storage facilities, develop an automatic metering system on a home delivery truck, and install wood pellet furnaces in several homes as a replacement for oil heat.

A similar project, involving the demonstation of 5 wood pellet furnaces in northern Ontario, is being conducted by J. Hince Dist. of Hearst.

The Ministry of Energy convened an interministry/industry task force on residential wood heat safety. It is reviewing present procedures for monitoring the safety of residential wood heating installations and exploring various options for addressing fire safety concerns such as the training of installers and chimney sweeps and a comprehensive consumer education program. The task force will report to the Ministry of Energy in the fall of 1984 with recommendations for a comprehensive administrative plan to improve and regulate wood heat safety.

WOOD ENERGY STUDIES SUPPORTED BY MINISTRY OF ENERGY

Studies are underway to determine the potential for viable energy projects in the following areas: Canada Starch in Cardinal, the Rideau Regional Centre in Smiths Falls, the Kemptville Agricultural College in Kemptville, the Ministry of Natural Resources Nursery in Kemptville, Procter & Gamble in Hamilton, Cities Heating in London, and Grant Waferboard in Englehart.

Hybrid poplar plantations are an important future energy source. New varieties have short harvest cycles of two to ten years; one hectare can produce more than 17 green tonnes of wood a year. To develop hybrids with higher energy content, the Ministry of Energy funds research in genetic breeding at the Ministry of Natural Resources Ontario Tree Improvement and Forest Biomass Institute in Maple, Ontario.

The Chapleau District Heating study concluded that excess steam heat produced by the burning of sawmill residue can be used to heat part of a nearby community and generate marketable electricity. It could be economically feasible to build a pipeline network to carry the heat to several commercial and institutional buildings in the community of Chapleau. Private sector proposals for implementation are currently being developed.

GOVERNMENT ASSISTANCE AVAILABLE

FEDERAL FUNDING: Federal tax incentives are available under Class 34 of the Capital Cost Allowance provision and the FIRE program provides grant assistance of up to 20 per cent of the cost of eligible equipment. Additional funding may be available from EnerDemo, a federal program to support new technologies to conserve energy and use renewable energy.

For the residential sector, the federal Canada Oil Substitution Program provides taxable grants of up to $800 to assist the installation of approved wood heating systems by homeowners who convert from oil.

PROVINCIAL FUNDING: The Ministry of Energy will share the risk of demonstration projects, the costs of technical and economic feasibility studies, and the capital costs of installing new systems which use a new technology or a new application of a proven technology. Recipients of funding participate in a monitoring and information transfer program designed to evaluate performance and stimulate further applications.

MORE INFORMATION

Immediate and long-term potential for energy from waste and biomass are outlined in the Ministry of Energy publication, Energy from Waste: A Program for Ontario, published in March 1980.

More information is available from the Forest Resources Unit, Energy from Waste/Biomass Section, Ontario Ministry of Energy, 56 Wellesley Street West, 10th Floor, Toronto, Ontario, M7A 2B7. Telephone: (416) 965-8059.

Appendix I

ONTARIO WOOD ENERGY PROJECTS

PROJECT/START-UP DATE FEEDSTOCK/ENERGY PRODUCT	CAPACITY TONNES/YEAR	OIL REPLACED BBL/Year	CAPITAL COST $000's
Constructed			
Shell Woodex/1980 Wood/Solid Fuel	225,000	265,000	4,500
Grenville College/1982 Wood/Hot Water	1,400	2,000	350
Kakabeka Timber/1982 Dry Wood/Hot Air	1,100	2,000	180
Foothill Greenhouses/1982 Dry Wood/Steam	1,000	2,000	180
Hillcrest High School/1983 Green Wood/Steam	1,700	1,900	263
Kingsway College/1984 Dry Wood/Steam	2,100	3,000	1,300
L.M. Frost Centre/1984 Wood/Hot Air	30	60	50
Minden Furnaces/1984 Wood Pellets/Hot Air	20	60	100
Hearst Furnaces/1984 Wood Pellets/Hot Air	40	120	80
Under Study			
Canada Starch/est.1986 Green Wood/Steam+ELect.	260,000	286,000	14,500 (Approx.)
Rideau R.C./est.1986 Green Wood/Steam	24,000	26,000	1,700
Kemptville Ag.Col./est.1986 Dry Wood/Steam	4,500	5,000	700
Chapleau/est.1986 Wood/Steam+Elect.	100,000	110,000	7,500
Procter & Gamble/est.1986 Wood/Steam	100,000	110,000	8,000 (Approx.)
London/est.1986 Sawdust/Steam	30,000	75,000	unavailable
Grant Waferboard/est.1986 Sanderdust/Steam	25,000	65,000	2,000